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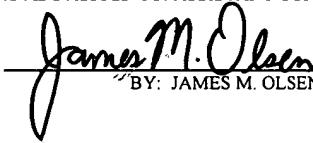
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for

**REPLACEABLE, REUSABLE COLLAR THAT
TEMPORARILY PROTECTS ROADWAY STRUCTURES**

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BACKGROUND OF THE INVENTION

A. Field of the Invention

The present invention relates generally to roadway structures, such as manholes, catch basins and utility access conduits, and, more particularly to a replaceable, reusable collar that temporarily protects such roadway structures, particularly those designed for use along or in a roadway carrying vehicular traffic, that are exposed above a roadway surface during roadway construction, including new roadway construction and roadway repair.

B. Description of the Related Art

At the present time, asphalt and/or concrete paving materials generally surround manholes, catch basins, utility access conduits, and the like. However, optimum compaction of the asphalt adjacent the peripheries of roadway structures, such as manholes, catch basins, and utility access conduits leads to deterioration of the asphalt in use. Expansion and contraction of the pavement occurs with varying temperatures and leads to asphalt break-up, cracking and separation between pavement and the roadway structure. Repairs typically are required at least every two to three years.

Repairing an asphalt roadway entails stripping a layer of the cracked, decayed asphalt from the roadway surface, including the asphalt adjacent the peripheries of manholes, catch basins, utility access conduits, and the like. Subsequently, a fresh, new layer of asphalt is applied in place of the stripped layer of asphalt, providing a smooth, flat roadway. Unfortunately, application of the new layer of asphalt does not always occur instantaneously after the stripping of the old asphalt, due to weather conditions, lack of equipment, or lack of manpower. Prior to application of the new asphalt, the peripheries of manholes, catch basins, utility access conduits, and the like extend above the stripped roadway surface, providing dangerous and damaging obstacles for vehicular traffic using

the roadway. The manholes, catch basins, utility access conduits and the like may be damaged themselves when struck by vehicular traffic.

The current solution to this problem is to provide a temporary layer of asphalt around the peripheries of manholes, catch basins, utility access conduits and the like. However, the temporary asphalt typically breaks up, cracks and separates from the peripheries of these structures since such asphalt is poorly applied or of inferior quality. Application of such temporary layers of asphalt is also costly due to the manpower, time, and equipment required to form them. For example, some states allot approximately \$40.00 per manhole for application of such temporary layers of asphalt.

SUMMARY OF THE INVENTION

An object of the invention is to provide a collar that temporarily protects roadway structures and vehicular traffic, such as manholes, catch basins and utility access conduits and solves the problems of the related art.

Another object of the invention is to provide a collar that temporarily protects roadway structures and vehicular traffic, is reusable, replaceable, and quickly and easily installed.

Additional objects and advantages of the invention will be set forth in part in the description which follows, and in part will be learned from the description, or may be learned by practice of the invention. The objects and advantages of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims.

To achieve the objects and in accordance with the purpose of the invention, as embodied and broadly described herein, the invention comprises a resilient, replaceable collar for protecting a roadway structure from damage caused by vehicular traffic and vice versa, the roadway structure

DO NOT FOLD

extending above a roadway pavement, the collar including: a body having upper and lower surfaces, an opening provided therethrough and sized to accommodate the outer periphery of the roadway structure, and sloped side walls extending downward from the upper surface of the body towards the lower surface of the body.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate several embodiments of the invention and together with the description, serve to explain the principles of the invention. In the drawings:

Fig. 1 is a top plan view of a first embodiment of the roadway structure protection collar of the present invention;

Fig. 2 is a side elevational view of the first embodiment of the collar shown in Fig. 1;

Fig. 3 is a bottom plan view of the first embodiment of the collar shown in Fig. 1;

Fig. 4 is a top plan view of a second embodiment of the roadway structure protection collar of the present invention;

Fig. 5A is a side cross-sectional view of the first embodiment of the collar shown in Fig. 1 as it surrounds a manhole of a roadway; and

Fig. 5B is a side cross-sectional view of a modified version of the first embodiment of the collar shown in Fig. 1 as it surrounds a manhole of a roadway and further having a riser to adjust the height of the collar.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to the present preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

In accordance with the invention, the present invention is broadly drawn to a resilient, replaceable collar that temporarily protects a roadway structure, such as a manhole, catch basin and utility access conduit protection, from damage caused by vehicular traffic when the roadway structure is exposed above the roadway pavement, such as when a layer of the roadway pavement is stripped from the roadway surface. The collar of the present invention also protects vehicles from damage caused by striking an exposed roadway structure, including damage to vehicle tires and alignment, as well as any damage which may occur if the vehicle loses control upon striking the exposed roadway structure. The collar has an opening sized to accommodate the roadway structure it is protecting and sloped side walls that slope from the top surface of the roadway structure down towards the roadway pavement.

As used herein the term "roadway structure" means any type of structure formed in a roadway other than the actual asphalt, gravel or concrete making up the roadway, such as, for example, manholes, catch basins, and utility access conduits. As used herein the term "roadway pavement" means the material making up the surface of the roadway, such as asphalt, gravel or concrete. Normally the roadway pavement surrounds the top surfaces of the manholes, catch basins or utility access conduits. However, to use the present invention a portion of the roadway pavement surrounding the roadway structures must either be removed from or recessed around these roadway

structures. The present invention will typically be used during repair or new construction of a roadway. Repairing an asphalt or concrete roadway entails stripping a layer of the asphalt or concrete from the roadway surface, including the asphalt or concrete adjacent the peripheries of manholes, catch basins, utility access conduits, and the like.

Fig. 1 shows a side elevational view of the first preferred embodiment of the protection collar 10 of the present invention. In this embodiment, resilient, protection collar 10 comprises a body 12 having a circular periphery, a generally planar upper surface 16, and a relatively large central opening 14 sized to accommodate and surround a rigid frame structure of a roadway structure, such as the frame of a manhole, catch basin, utility access conduit and the like. As best shown in Fig. 2, body 12 has an outer side wall 19 having a substantially sloped portion 18 and a generally vertical portion 20, outer side wall 19 is integrally connected to upper surface 16 of body 12. Sloped portion 18 of outer side wall 19 slopes away from upper surface 16 of body 12 and towards the roadway surface which has been stripped of a layer of asphalt or concrete. Body 12 further includes a generally planar lower surface 22, as best shown in Fig. 3, adapted to rest upon the roadway surface which has been stripped of a layer of asphalt or concrete.

The shape of roadway structure to be protected dictates the shape of the collar body of the present invention, as well as the central opening formed in the collar body. For example, the rigid frame of a manhole or catch basin, which generally supports a closure or cover, generally is round but may take other geometric shapes, such as a square, a rectangle, a hexagon, or an octagon. Although shown as circular in the first embodiment of Figs. 1-3, the collar body of the present invention make take other geometric shapes, such as a square, a rectangle, a hexagon, or an octagon. Preferably, however, the collar of the present invention has a circular outline to provide for an even

distribution of forces applied to the resilient collar in use.

Likewise the central opening of the collar body of the present invention is shaped to correspond to the shape of the rigid frame structure of the roadway structure, so as to snugly fit against the periphery of the frame structure. Thus, the central opening of the collar body of the present invention may take on several geometric shapes, such as for example, a circle, a square, a rectangle, a hexagon, or an octagon, depending upon the geometry of the rigid frame structure of the roadway structure.

By way of example, Fig. 4 presents a top plan view of a second embodiment of the roadway structure protection collar 100 of the present invention, having a square configuration. As shown, collar 100 comprises a square body 102 having a substantially planar upper surface 106 and a substantially large central opening 104 sized to accommodate and surround a rigid frame structure of a roadway structure, such as the frame of a manhole, catch basin, utility access conduit and the like. Collar body 102 has four substantially sloped side walls 108 integrally connected to upper surface 106 of body 102. Sloped side walls 108 slope away from upper surface 106 of body 102 and towards the roadway surface which has been stripped of a layer of asphalt or concrete. Collar body 102 further includes a generally planar bottom surface, not shown, adapted to rest upon the roadway surface which has been stripped of a layer of asphalt or concrete.

Fig. 5A shows a side cross-sectional view of the first embodiment of the collar of the present invention as it surrounds a conventional manhole provided in a roadway. The manhole includes a rigid hollow structure having side walls 28 that typically are made from concrete. The hollow structure forms a vertical passageway 30 which may provide access to an underground pipe or pipes located at or near the bottom of the structure. Mounted on top of the manhole is a rigid, metal frame

structure 34 which forms its own access opening for entry into the hollow structure of the manhole. Typically, the structure 34 is made from heavy cast iron as is a manhole cover 32 supported thereby. Quite often, as in Fig. 5A, structure 34 forms a circular opening but the opening may have other shapes as well. Roadway pavement 40 comprising either concrete or asphalt surrounds the manhole structure. Collar body 12 is provided to surround metal frame structure 34 of the manhole. Specifically, lower surface 22 of body 12 rests on roadway pavement 40, upper surface 16 of body 12 sits flush with the top surface of manhole cover 32, and opening 14 of body 12 snugly engages the outer periphery of manhole metal frame structure 34. The sloped portion 18 of outer side wall 19 provides a smooth transition for a vehicle's tire 24 as it travels from roadway pavement 40 over manhole cover 32.

Generally, the collar body has a thickness corresponding to how far the roadway structure extends above the roadway pavement. However, the thickness of the collar may be adjusted to accommodate how much of the roadway pavement is removed from around the roadway structure. Typically, for example, enough roadway pavement is removed to expose the entire vertical portion of manhole metal frame structure 34. The vertical portion of manhole metal frame structures usually have a height in the range of 1½ to 2 inches. If the present invention were used with such a roadway structure, the thickness of the collar would preferably have a thickness (as shown by reference numeral H₁ in Fig. 2) in the range of 1½ to 2 inches. If the roadway structure does not extend this far above the roadway surface, the collar body of the present invention may be made thinner.

Alternatively, as shown in Fig. 5B, the height of the collar body may be adjusted using a resilient, replaceable riser 42 that may be placed between the lower surface of a collar body 12A and the roadway pavement 40. Resilient riser 42 preferably has the same geometric shape as the collar

body it supports, and is preferably made from the same material as the collar body. Riser 42 also has a central opening that communicates with the central opening of the collar body. A plurality of risers 42 may be employed to further adjust the height of the collar body of the present invention. Preferably, the thickness of the collar body or the adjustment provided by the risers ensures that the upper surface of the collar body is flush with the top surface of the roadway structure. As further shown in Fig. 5B, the collar body 12A need not have a flat upper surface. Rather, the sloped portions of the side walls may extend to the central opening of collar body 12A. Although shown in use with the modified collar body 12A, risers 42 of the present invention may be used with collar body 12 shown in Figs. 1-3.

Installation of the resilient, replaceable and reusable collar of the present invention is simple. The central opening in the collar body is fitted around the periphery of the roadway structure extending above the roadway pavement so that the lower surface of the collar body engages the roadway pavement. If the height of the collar needs to be adjusted, the thickness of the collar may be increased or a resilient, replaceable riser may be placed below the collar. The resilient, reusable collar of the present invention temporarily protects a roadway structure extending above a roadway pavement, as well as the vehicular traffic traveling over the structure, until the roadway pavement may be replaced around the exposed roadway structure. For example, during roadway construction a decaying layer of the roadway pavement (asphalt or concrete) is stripped from the roadway, exposing the peripheries of the roadway structures (manholes, catch basins, utility access conduits, and the like) provided in the roadway. After the decaying layer is stripped off, but before application of the new layer of roadway pavement, the collars (and possibly the risers) of the present are placed around the exposed peripheries of the roadway structures to protect the roadway structures from

vehicular traffic and vice versa. The collars (and possibly the risers) of the present invention are subsequently removed prior to application of a fresh, new layer of the roadway pavement around the peripheries of the roadway structures so that the new roadway pavement may surround the roadway structures, providing a smooth, flat roadway.

The resilient collar body of the present invention may be made from any resilient, elastomeric material, but preferably is formed of a rubber (natural or synthetic) material, a plastic material, or a recycled plastic material. More preferably, the collar body of the present invention comprises cured recycled rubber scrap from tires. Recycled rubber scrap from tires has a relatively long life expectancy, such as twenty years or more, so that the resilient collar may be used over and over again.

The invention will be further clarified by the following examples, which are intended to be purely exemplary of the invention, and are not to be construed to limit the scope of the claimed invention. Conventional circular manholes have a metal frame structure with a diameter of 25½ inches. If the present invention were used with such conventional manholes, the collar body opening would be 25¾ inches so that collar body would snugly engage the outer periphery of the manhole metal frame structure. Whereas, if the present invention were used with conventional utility access conduits having a diameter of 10 inches, the collar body opening would be 10¼ inches.

The following dimensions are purely exemplary of the first embodiment of the present invention since such dimensions will vary in practice depending upon the roadway structure to be protected and the condition of the roadway pavement. Collar body 12 may have a width W (as shown in Fig. 3) of at least 8 inches. The thickness H_1 of collar body 12, as shown above, may be in the range of 1½ to 2 inches, although this depends upon how much of the roadway structure is

exposed above the roadway pavement. Vertical portion 20 of side wall 19 may have a height H_2 (as shown in Fig. 2) of $\frac{1}{2}$ inches. Preferably, sloped portion 18 of side wall 19 is sloped at an angle α (as shown in Fig. 2) so to provide a smooth transition for vehicular traffic as it passes from the roadway pavement over the roadway structure. For example, angle α may be in the range of 5 to 20 degrees.

The manufacturing mold used for molding the resilient collar of the present invention may be designed to accommodate a variety of different sizes and configurations of roadway structures while maintaining the same external dimension of the collar. The molding operation forming the collar of the present invention preferably effects the compression molding of a rubber mix from scrap tires or other scrap rubber or plastic material to a desired density, modulus of elasticity, thermal expansion and hardness for the molded collar.

By employing scrap rubber or plastic material in the manufacture of the collar, recycle of such waste material into a useful product is achieved. The collar does not generate waste, since damaged or discarded collars can themselves be recycled and fully used in the production of new or reconditioned collars.

The resilient, reusable collar of the present invention absorbs shock and prevents vehicular traffic damage to the roadway structure and vice versa. The collar further avoids the related art problems of break-up, cracking and separation between the roadway structure and the temporary layer of roadway pavement temporarily surrounding the roadway structure. The rugged, durable material used for the collar of the present invention enables the collar to be used over and over again. Furthermore, the collar is easily installed with limited manpower and without the need for equipment. Thus the resilient collar of the present invention provides a low cost means for

protecting a variety of roadway structures from vehicular traffic and vice versa. Finally, the collar is an environmentally cleaner and safer alternative to the related art devices.

Other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.

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